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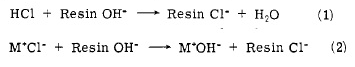
Final paper:

**Developments of Ion Chromatography Technology with Suppressors**

Ion Chromatography (IC) has an important role in the analysis of inorganic and organic ions. The IC is developed to separate ions and detection methods in many difference ways [1]. This is only system using two columns before going to detector [3]. It uses to determine environmentally waters such as waste water, rivers, lakes and fluids of biological such as blood and urine [2]. More than twenty years ago, IC was only able to identify in inorganic ion, used ion exchange column to separate the ions, and detected by conductometric monitoring [1]. This paper will focus on the evolution of detector, elution suppression, and suppressors in modern ion chromatography.

In the past, Ion exchange resin column provided good separation of ions, but the eluent from this column carry on the background electrolyte that prevented the detector was not able to detect ions interest against this background. New stripper column combination with resins was introduced to “strip out” or neutralized the background electrolyte ions [2].

This new method process of IC was added stripper column after separate column to neutralize electrolyte ions leaving background of de-ionized water. The interest ions were detected without interfere with ion of background. For example figure 1, the cation analysis samples containing Li+, Na+, and K+, using HCl as the eluant is passed to two columns separate column and stripper column. When cation sample is injected to first column, they will be separated and will exit with different times from the bottom of column. In the stripper column, there are two reactions: 1) HCl is replaced by the strong base resin; 2) the chlorides are changed to hydroxides [2]. However, the stripper column caused the peak broader and loss resolution [3, 4].



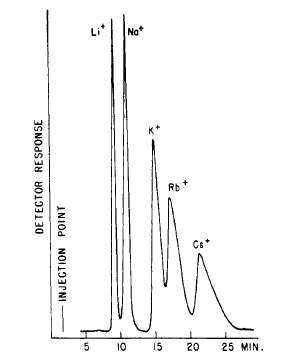
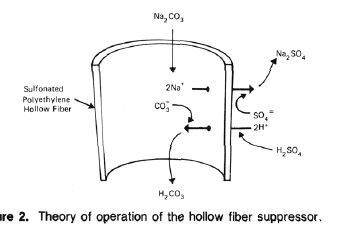


Figure 1: Separation of alkali metal.

The ion-exchange hollow fibers suppressor was introduced to solve the problem of stripper column. The hollow fiber suppressor was made by a coiled of 2 mm i.d, 1.8 in. o.d., and 316 stainless steel (figure 2). This fiber suppressor used with sodium carbonate as the eluent and it was able to determine anions samples. The sulfuric acid was supplied while using the hollow fiber suppressor. The material of walls of this suppressor was the sulfonated polyethylene fiber to allow sodium ion going out and hydrogen ion going through the wall. Sulfate and carbonate ions did not pass the fiber wall. Carbonate ion attached to hydrogen ion to make carbonic acids which enhance conductivity of anion samples. Besides, sulfate ion attached to sodium ion to product sodium sulfate.



The hollow fiber suppressor was compared to two suppressor columns to determine acetate ion. The small suppressor column had size 2.8 X 300 mm and the large one had size 9 X 110 mm. By using difference suppressors the acetate ion peak presented differences. The small suppressor column resulted peak of acetate ion sharp and tall, while the peak of large suppressor showed broaden and retard. The acetate peak of hollow fiber suppressor was taller and sharper than both suppressor columns. [3]